

art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 1991)).

An invention can be obvious even though the suggestion to combine prior art teachings is not found in a specific reference. *In re Oetiker*, 977 F.2d 1443, 24 U.S.P.Q.2d (BNA) 1443 (Fed. Cir. 1992). However, while it is not necessary that the cited references or prior art specifically suggest making the combination, there must be some teaching somewhere which provides the suggestion or motivation to combine prior art teachings and applies that combination to solve the same or similar problem which the claimed invention addresses. One of ordinary skill in the art will be presumed to know of any such teaching. (See, e.g., *In re Nilssen*, 851 F.2d 1401, 1403, 7 U.S.P.Q.2d 1500, 1502 (Fed. Cir. 1988) and *In re Wood*, 599 F.2d 1032, 1037, 202 U.S.P.Q. 171, 174 (C.C.P.A. 1979)). However, the level of skill is not that of the person who is an innovator but rather that of the person who follows the conventional wisdom in the art. *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 474, 227 U.S.P.Q. 293, 298 (Fed. Cir. 1985). The requirement of a suggestion or motivation to combine references in a *prima facie* case of obviousness is emphasized in the Federal Circuit opinion, *In re Sang Su Lee*, 277 F.3d 1338; 61 U.S.P.Q.2D 1430 (Fed. Cir. 2002), which indicates that the motivation must be supported by evidence in the record.

The test for obviousness under § 103 must take into consideration the invention as a whole; that is, one must consider the particular problem solved by the combination of elements that define the invention. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985). The Examiner can only rely on references which are either in the same field as that of the invention, or if not in the same field, the references must be "reasonably pertinent to the particular problem with which the inventor was concerned." *M.P.E.P.* § 2141.01 (a) (citing *In re Oetiker*, 24 U.S.P.Q.2d (BNA) 1443 at 1445). The Examiner must also recognize and consider not only the similarities but also the critical differences between the claimed invention and the prior art. *In re Bond*, 910 F.2d 831, 834, 15

U.S.P.Q.2d (BNA) 1566, 1568 (Fed. Cir. 1990), *reh'g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990).

If the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *M.P.E.P.* § 2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984)). The Examiner must also avoid hindsight. *Id.* The Examiner cannot use the Appellant's structure as a "template" and simply select elements from the references to reconstruct the claimed invention. *In re Gorman*, 933 F.2d 982, 987, 18 U.S.P.Q.2d (BNA) 1885, 1888 (Fed. Cir. 1991).

Applicant submits that a *prima facie* case of obviousness has not been established. The Office Action states that a person of ordinary skill is motivated to modify Tan with Bernier to use electroless plating to deposit Cu to obtain a simpler and less costly process. Applicant can not find where Tan or Bernier suggest to one of skill in the art that such a modification would result in a simpler and less costly process. There must be some teaching somewhere which provides the suggestion or motivation to combine prior art teachings and applies that combination to solve the same or similar problem which the claimed invention addresses. Accordingly, there is no motivation to modify Tan with Bernier.

Applicant respectfully submits that the Examiner may be relying on hindsight. It is well settled that the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. The present application states

The present invention provides for a multilayer copper wiring structure by electroless, selectively deposited copper in a streamlined process which will not require chemical mechanical planarization (CMP). Thus, the present invention significantly reduces the amount of deposited conductive material, e.g. copper, which is ultimately discarded according to conventional processes. This alleviates important environmental concerns regarding the disposition of used materials. Further, by avoiding the need for a CMP process step, the usage of consumables such as pads and slurry is conserved.¹

¹ Specification Page 4, lines 19-26

Thus, the present invention uses a simpler and less costly process. Applicant believes that the examiner is using the Appellant's disclosure as a "template" and simply select elements from the references to reconstruct the claimed invention. This is not permitted.

Moreover, the examiner refers to Kozlov, U.S. Pat. No. 6,387,542 in the final Office Action. Kozlov has a filing date of July 6, 2000, which is after the filing date of the present application. Accordingly, the examiner is prohibited from relying on Kozlov.

One of skill in the art would not be motivated to modify Tan with Bernier as Tan explicitly teaches away from the presently claimed invention. More specifically, Tan states that its seed layer is for electroplating.² Thus, Tan teaches away from the present invention as recited in independent claims 1, 7, 8, 13, 20, 28, and 34, which each recite electroless plating.

Applicant further submits that one of skill in the art would not look to Bernier for a teaching of electroless plating that can be combined with Tan. Bernier teaches a complex laser processing of a resin that contains palladium to form a seed layer. Bernier admits that its laser technique used on polyimide results in substrate deterioration (page 331 and 333). Bernier further admits that its laser technique has poor palladium adhesion to a Si₃N₄ substrate (page 333). Thus, one of skill in the art would not look to the teachings of Bernier to modify Tan as Bernier's techniques have admitted faults.

The final Office Action further states that

Both electroplating and electroless plating are conventional methods of depositing metals, at least one of the benefits of using electroless plating compared to electroplating is the simplicity of the method, there is no need to control temperature and supply a current to perform plating, the energy cost would be lower than the electroplating method which requires a current to be supplied (see Hall. US Patent 4394223, col. 1, lines 16-40 and Kozlov et al., US Patent 6387542, col. 1, lines 21-48).

Again, Kozlov is not prior art and should not be relied on in the rejection of the pending claims.

Moreover, the electroless plating may be simple in some respects but may be more complex in other respects, e.g., selecting the proper chemical bath to achieve the proper reaction without incorrectly depositing on the substrate or harming the substrate.

² Tan, U.S. Pat. No. 6,372,622, col. 3, line 46.

Further, applicant respectfully disagrees with the rationale that Bernier et al. discloses the benefit of selectivity over the electroplating of Tan. Tan is also selective in its formation of copper stud 30, i.e., copper studs are totally within openings 22 (col. 4, line 6). Thus, Bernier does not teach an advantage of selectivity over Tan's electroplating. Accordingly, it would not be advantageous to modify Tan with Bernier to provide selectivity as Tan already has selectivity.

Based at least on the above, applicant respectfully submits that a *prima facie* case of obviousness has not been made. Reconsideration of all claims is respectfully requested.

Claims 13-27 and 34-37 were rejected under 35 USC § 103(a) as being unpatentable over Tan et al. in view of Bernier et al. and Simpson (U.S. Patent No. 6,197,688). Applicant traverse.

Applicant does not admit that the Simpson patent is prior art to the present invention and reserves the right to swear behind this patent at a later date. Nevertheless, Applicant also submits that the present invention is distinguishable over Tan in view of Bernier and Simpson. Applicant respectfully traverses for at least the reasons stated above and in the prior response, which is incorporated by reference to preserve issues for appeal.

Claims 28-33 and 38-42 were rejected under 35 USC § 103(a) as being unpatentable over Tan et al. in view of Bernier et al. and Simpson and Tomita et al. (U.S. Patent No. 5,034,799). Applicant respectfully traverses for at least the reasons stated above and in the prior response, which is incorporated by reference to preserve issues for appeal.